1. Economic Structure

Elements of the Bay Area Goods Movement Economy

Freight transportation is often described as a derived demand; that is, the level of demand is driven by the characteristics of the economy. A region's goods movement system is a reflection of it's economy.

There are three major elements of the Bay Area goods movement economy that have distinct characteristics with respect to the commodities traded, the industries that participate in trade, the transportation modes that provide service, the geographic dimension of origins and destinations (trade sheds) and the networks over which goods flow:

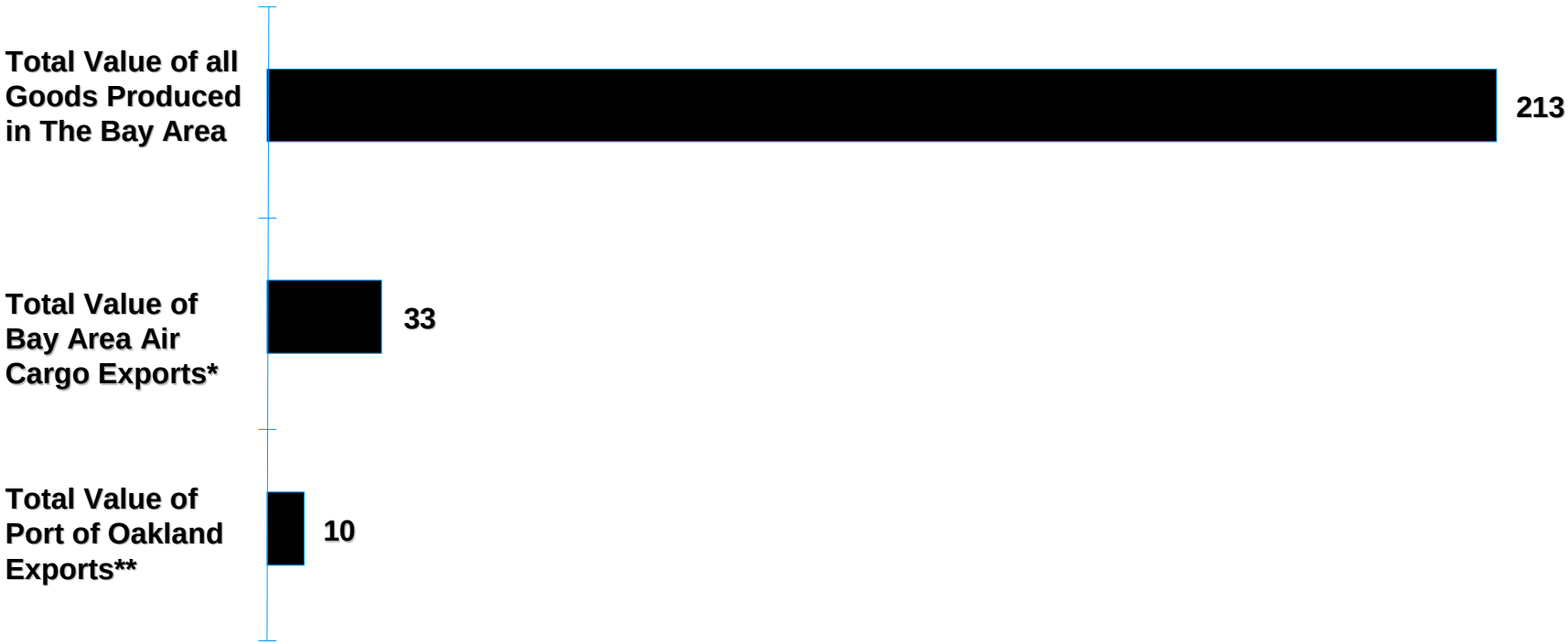
- International trade
- Domestic trade
- Local distribution.

International Trade

According to the U.S. Bureau of the Census, $79.6 billion of merchandise trade moved through the San Francisco Customs District in 2002. The Port of Oakland, the region's leading seaport is somewhat unique among West Coast ports in that export container cargo volumes exceed import container volumes, indicating the critical role this port plays in the U.S. economy as well as providing an outlet to markets for California businesses. International air cargo was valued at $26 billion dollars in 2002. This value is down by almost half from the peak of $46.2 billion in 2000, but still almost double the $14.7 billion of air cargo in 1992.

International trade is a growing component of the Bay Area economy. Between 1993 and 1999, the value of exports from the five Bay Area urbanized areas (San Francisco, San Jose, Oakland, Vallejo-Fairfield-Napa, and Santa Rosa) increased by 49.5%, with largest absolute growth in the San Jose MSA (over $12 million or 74.7% growth) and the Oakland MSA (over $2.5 million or 60.5% growth). Asia is the largest trading partner for the Bay Area, but trade with NAFTA partners grew by almost 90% between 1993 and 1999.

Economic Activity of Airports and Marine Ports Relative to Overall Bay Area Economy $ Billions



Source: U.S. Department of Commerce, Bureau of Census (1999).
***Includes all air cargo exports in the San Francisco Customs District; a small percentage is pass-through.**
****Includes exports that are generated further inland from the Bay.**

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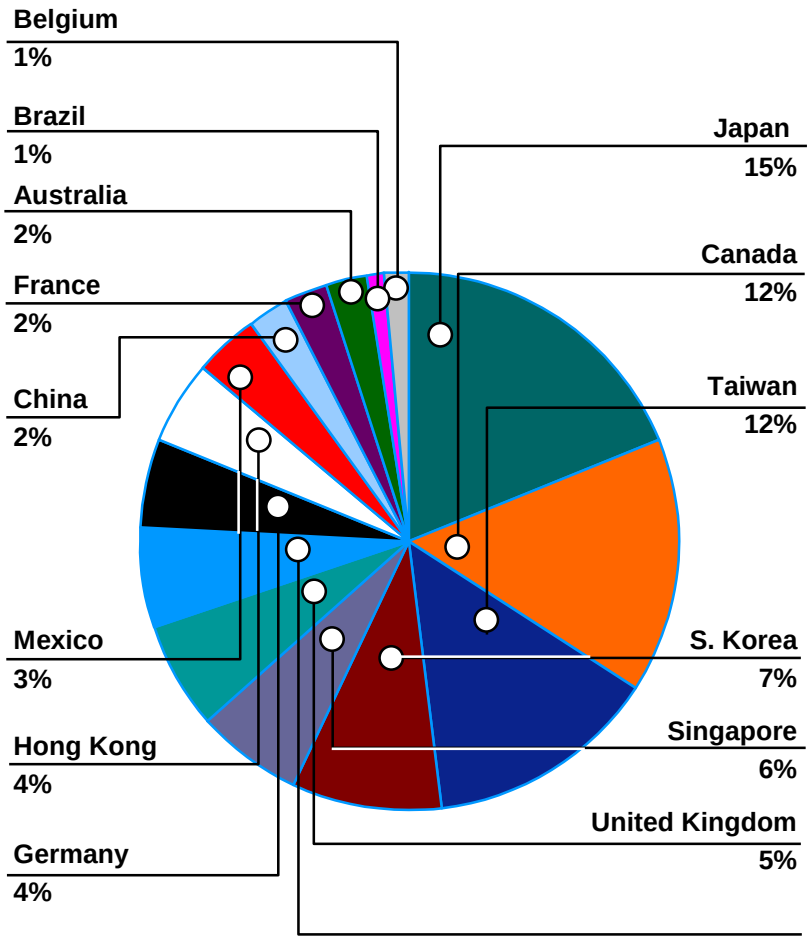
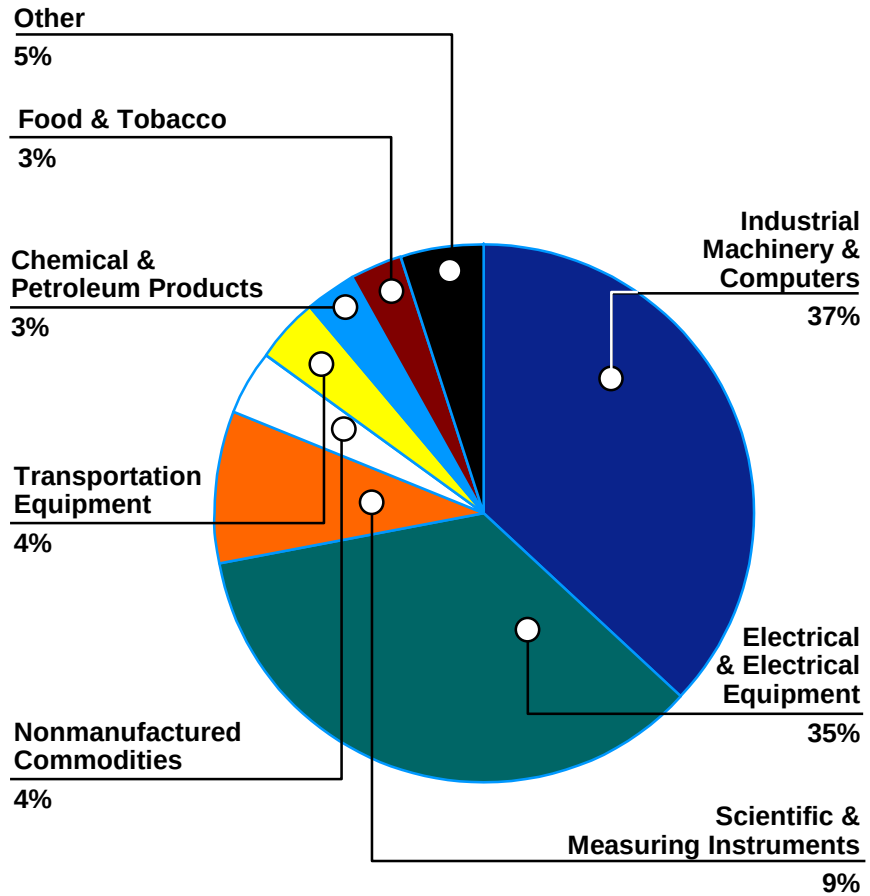
International Exports for Bay Area





Note: Flows to other countries were 19% of the total

Source: U.S. Department of Commerce, 2002.

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International Exports from Bay Area Urban Areas

Thousands of dollars	San Francisco		San Jose		Oakland	
Market	1993	1999	1993	1999	1993	1999
NAFTA Countries	$798,234	$872,418	$2,209,160	$4,680,198	$573,705	$1,210,608
Europe	$2,448,132	$2,470,445	$4,541,732	$6,726,877	$757,032	$1,808,985
Asia	$4,552,536	$4,581,156	$8,589,336	$15,213,193	$2,390,514	$3,338,888
Caribbean and Central America	$232,609	$259,306	$20,222	$112,379	$20,587	$35,422
South America	$486,858	$402,715	$237,334	$714,680	$92,861	$97,776
Africa	$189,851	$67,431	$86,542	$90,835	$188,876	$43,812
Near East	$291,352	$158,915	$177,699	$348,628	$50,816	$67,850
Australia	$265,328	$222,159	$309,487	$368,949	$107,870	$106,133
Rest of the World	$0	$442	$57	–	–	–
World (Total)	$9,264,899	$9,034,987	$16,171,568	$28,255,739	$4,181,478	$6,709,494

Thousands of dollars	Vallejo-Fairfield Napa		Santa Rosa		5 MSA Total	
Market	1993	1999	1993	1999	1993	1999
NAFTA Countries	$58,026	$68,914	$68,591	$178,739	$3,707,716	$7,010,877
Europe	$39,427	$124,907	$163,339	$354,035	$7,949,662	$11,485,249
Asia	$64,101	$66,536	$151,786	$281,756	$15,748,273	$23,481,529
Caribbean and Central America	$1,269	$1,315	$2,043	$6,674	$276,730	$415,116
South America	$1,613	$4,201	$9,208	$16,830	$827,874	$1,236,202
Africa	$1,221	$1,359	$1,813	$4,913	$468,303	$1,236,202
Near East	$2,228	$6,911	$1,783	$8,529	$523,878	$590,833
Australia	$3,830	$9,869	$10,505	$14,032	$696,237	$721,142
Rest of the World	–	–	–	–	$57	$442
World (Total)	$171,715	$284,012	$409,067	$865,508	$30,198,727	$45,149,740

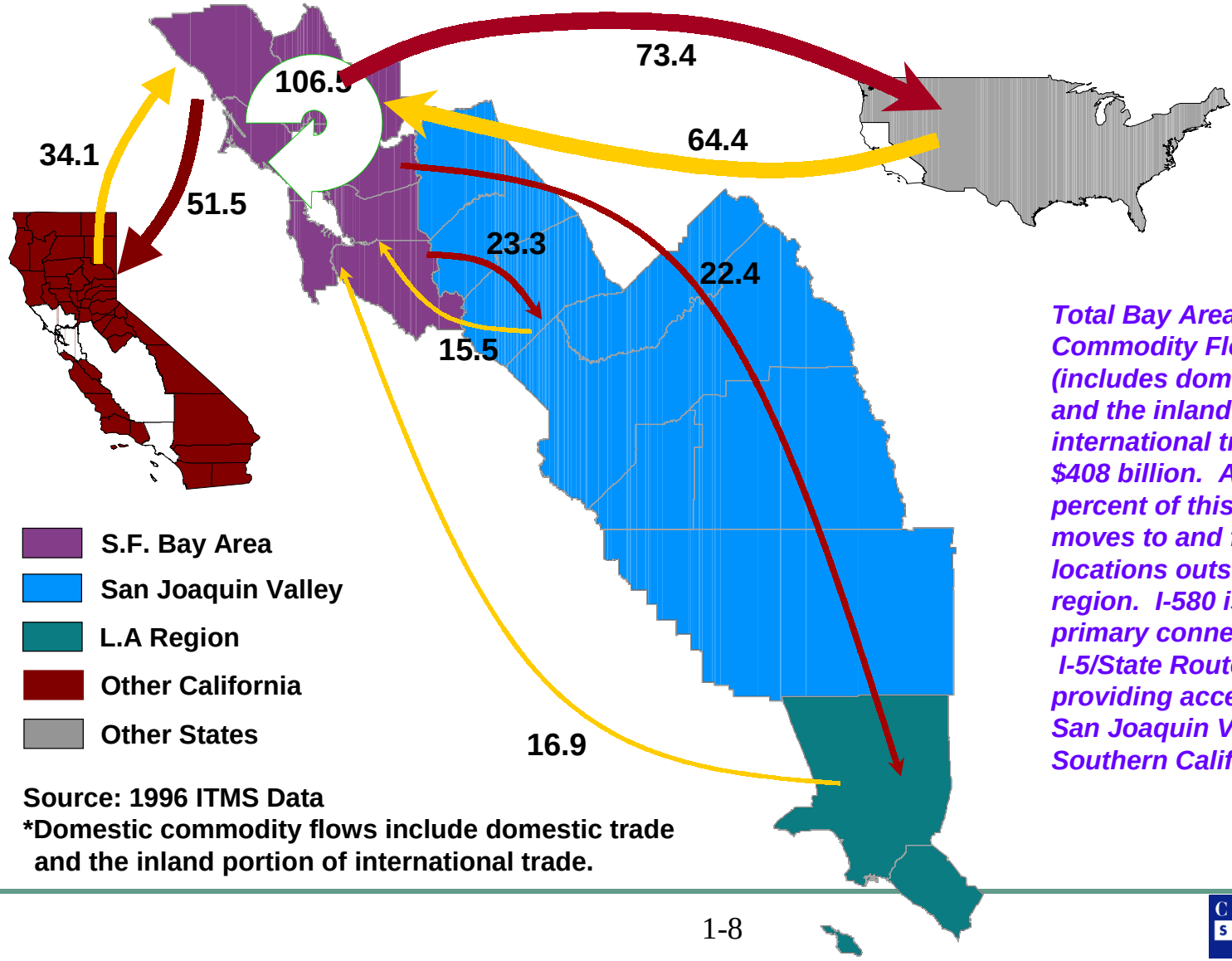
Source: U.S. Department of Commerce, 2002.

Note: Destinations are based on final origins and destinations of goods, and does not include “pass-through” traffic

Commodity Movement Between Bay Area and Rest of the Nation

A major element of the Bay Area goods movement economy is trade with the rest of the United States. Domestic trade outside of the Bay Area comprises 54% by tonnage and 74% by value of all inland trade involving the nine Bay Area counties. Domestic trade provides a market for goods produced by Bay Area industries. Leading commodities traded with the rest of the nation include electrical machinery, equipments, warehouse and distribution activity and food products. Domestic trade is also important to the Bay Area economy because local industries and consumers obtain goods from the rest of the nation. The significance of the Bay Area consumer markets are indicated by the balance in trade of goods between the Bay Area and the rest of the U.S. (32% tons inbound as compared to 22% tons outbound). By tonnage, major commodities shipped into the Bay Area from elsewhere in the U.S. include non-metallic minerals, crude petroleum, construction materials, and food products. Domestic trade is conducted over a network of interstate highway corridors (I-80, I-580 to I-5, and U.S. 101 are major gateway corridors), mainlines of 2 Class I rail carriers (the Union Pacific and the Burlington Northern Santa Fe), and through three major airports (SFO, OAK, and SJC). Trucking carries the largest share of domestic trade in terms of both tonnage and value.

I-580 is the Primary Gateway for Nearly 20% (in billions $) of Bay Area Domestic Trade Flow



Source: 1996 ITMS Data
*Domestic commodity flows include domestic trade and the inland portion of international trade.

Total Bay Area Domestic Commodity Flow (includes domestic trade and the inland portion of international trade) = $408 billion. Almost 75 percent of this amount moves to and from locations outside the region. I-580 is the primary connection to I-5/State Route-99, providing access to the San Joaquin Valley and Southern California.

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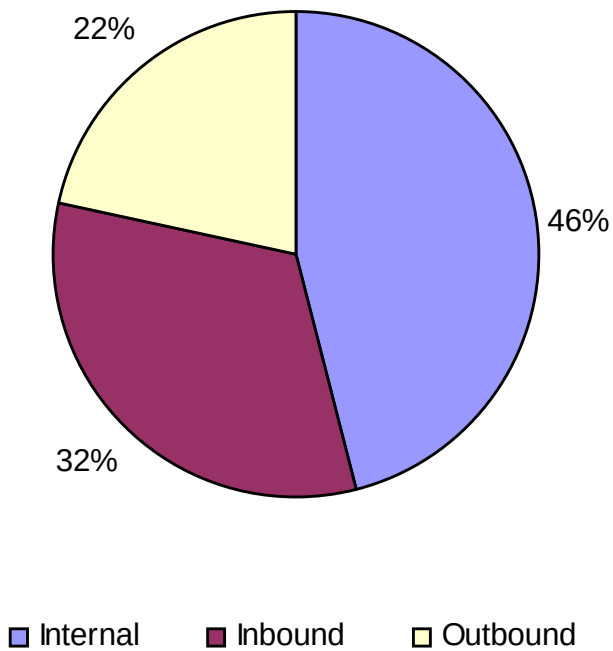
Bay Area Domestic Commodity Flow Balance

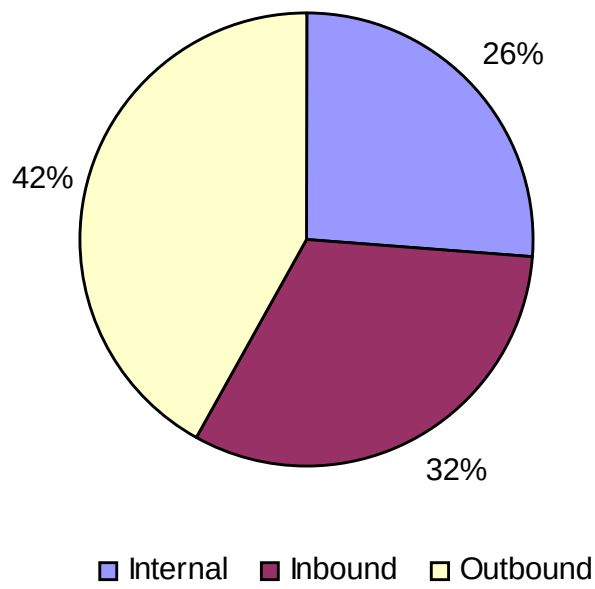
100% = 322 M Tons

By TONS



100% = $ 408 B

By VALUE



Source: 1996 ITMS Data

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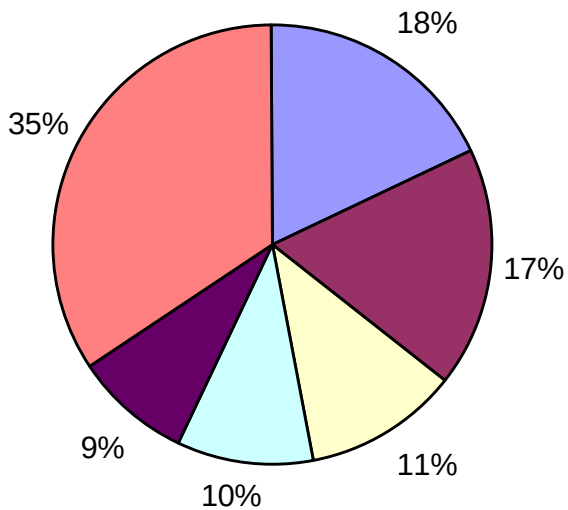
Bay Area Domestic Inbound Commodity Flows Top 5 Commodities

100% = 104 M Tons

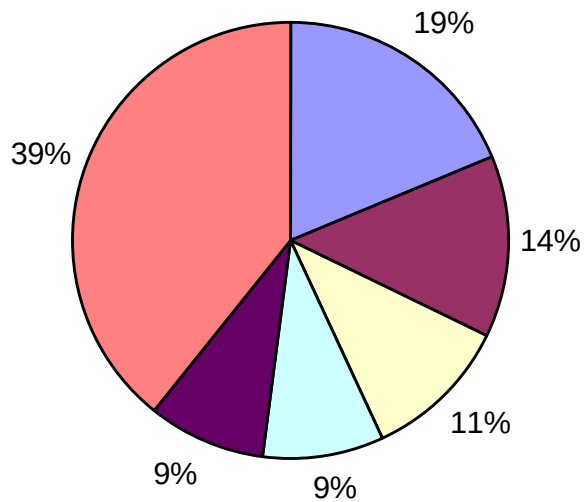
By TONS



- Nonmetallic minerals
- Crude Petroleum, natural gas or gasoline
- Warehouse & Distribution Center, Rail Intermodal Drayage
- Food and kindred products
- Clay, concrete, glass or stone products
- Others

100% = $ 131 B

By VALUE



- Warehouse & Distribution Center, Rail Intermodal Drayage
- Electrical machinery, equipment or supplies
- Transportation equipment
- Food and kindred products
- Machinery excl. electrical
- Others

Source: 1996 ITMS Data

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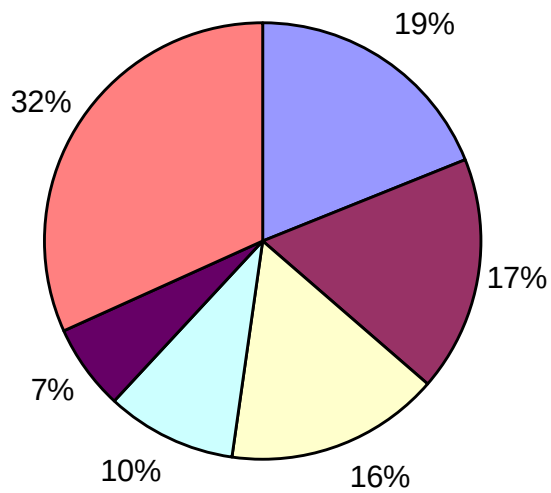
Bay Area Domestic Outbound Commodity Flows Top 5 Commodities

100% = 70 M Tons

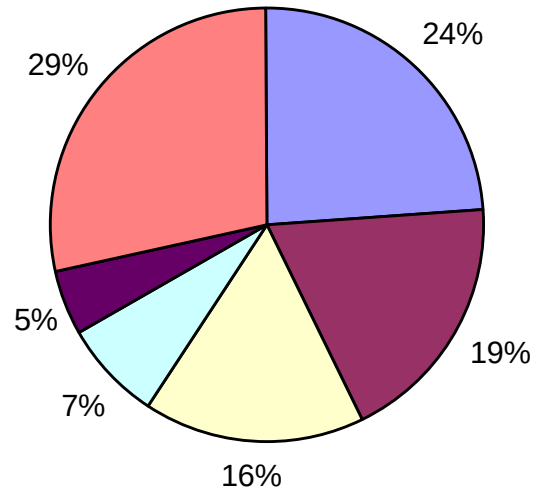
By TONS



- Warehouse & Distribution Center, Rail Intermodal Drayage
- Petroleum or coal products
- Food and kindred products
- Clay, concrete, glass or stone products
- Nonmetallic minerals
- Others

100% = $ 171 B

By VALUE



- Electrical machinery, equipment or supplies
- Machinery excl. electrical
- Warehouse & Distribution Center, Rail Intermodal Drayage
- Food and kindred products
- Transportation equipment
- Others

Source: 1996 ITMS Data

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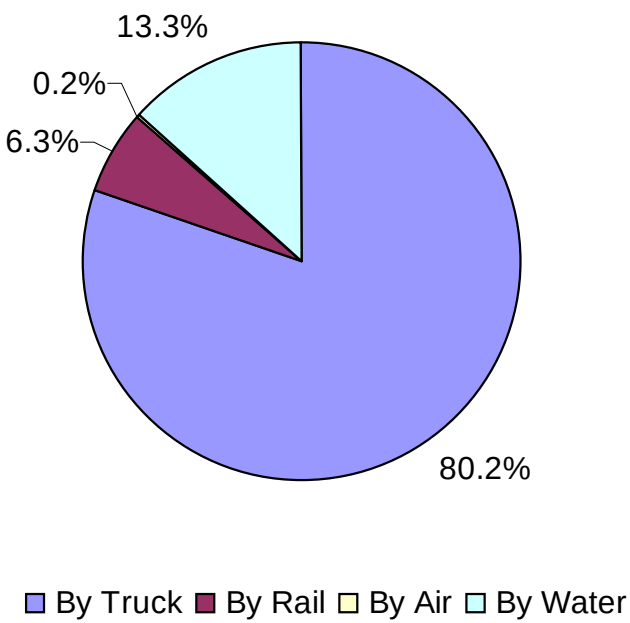
Trucking Carries the Largest Share of Domestic Trade by Both Tons and Value

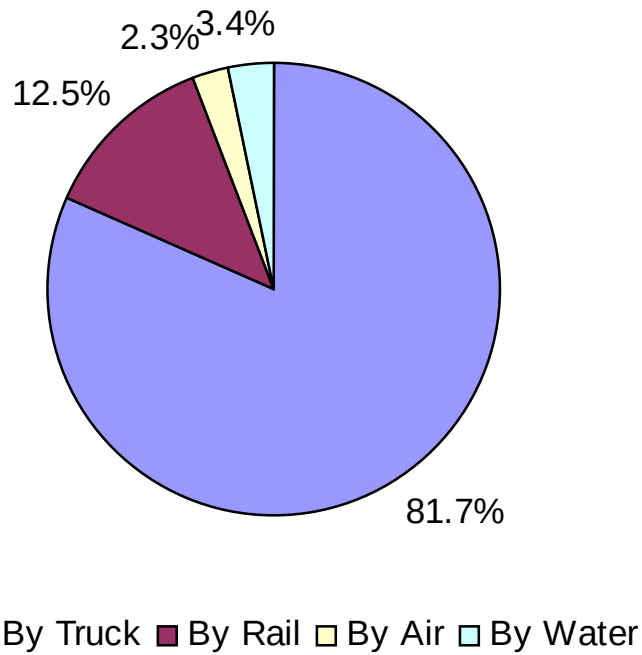
100% = 322 M Tons

By TONS



100% = $408 B

By VALUE



Source: 1996 ITMS Data

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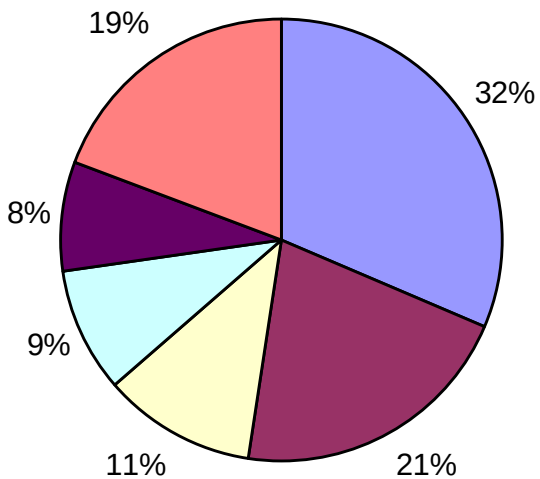
Local Distribution and Service

Local distribution and service activity comprises an important component of the Bay Area goods movement economy in terms of tons moved, value of product, and traffic impacts on the region's roadways. 46% of all the tonnage moved through Bay Area moves entirely within the nine county region. The major economic activities that generate this goods movement include warehouse and distribution activity that moves goods from warehouses to retailers and consumers, movement of construction materials to support the growing housing and commercial real estate markets of Northern California, and local parcel and courier services. In addition, traffic from service vehicles (for example, trash and waste collection) generates a significant amount of local goods movement activity.

Bay Area Internal Commodity Flows
Top 5 Commodities

100% = 149 M Tons

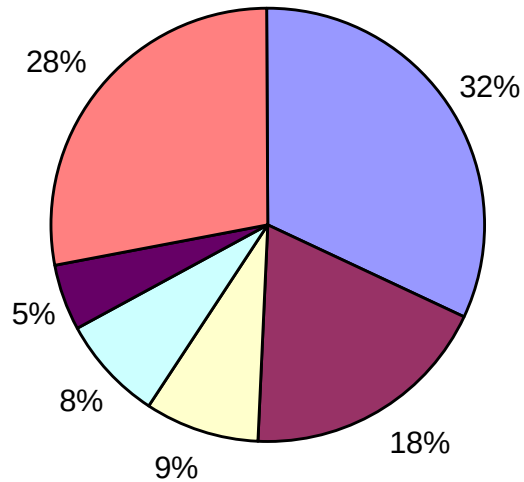
By TONS



- Clay, concrete, glass or stone products
- Nonmetallic minerals
- Warehouse & Distribution Center, Rail Intermodal Drayage
- Petroleum or coal products
- Waste or scrap materials
- Others

100% = $ 106.5 B

By VALUE



- Warehouse & Distribution Center, Rail Intermodal Drayage
- Electrical machinery, equipment or supplies
- Machinery excl. electrical
- Food and kindred products
- Clay, concrete, glass or stone products
- Others

Source:1996 ITMS Data

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Goods Movement and the Bay Area Economy

Another way to think about the importance of goods movement to the Bay Area economy is to consider the fraction of local economic activity associated with the following activities:

- Consumption of goods as production inputs and to supply consumer markets
- Production of goods for shipment
- Purchase of freight transportation services to support Bay Area industries.

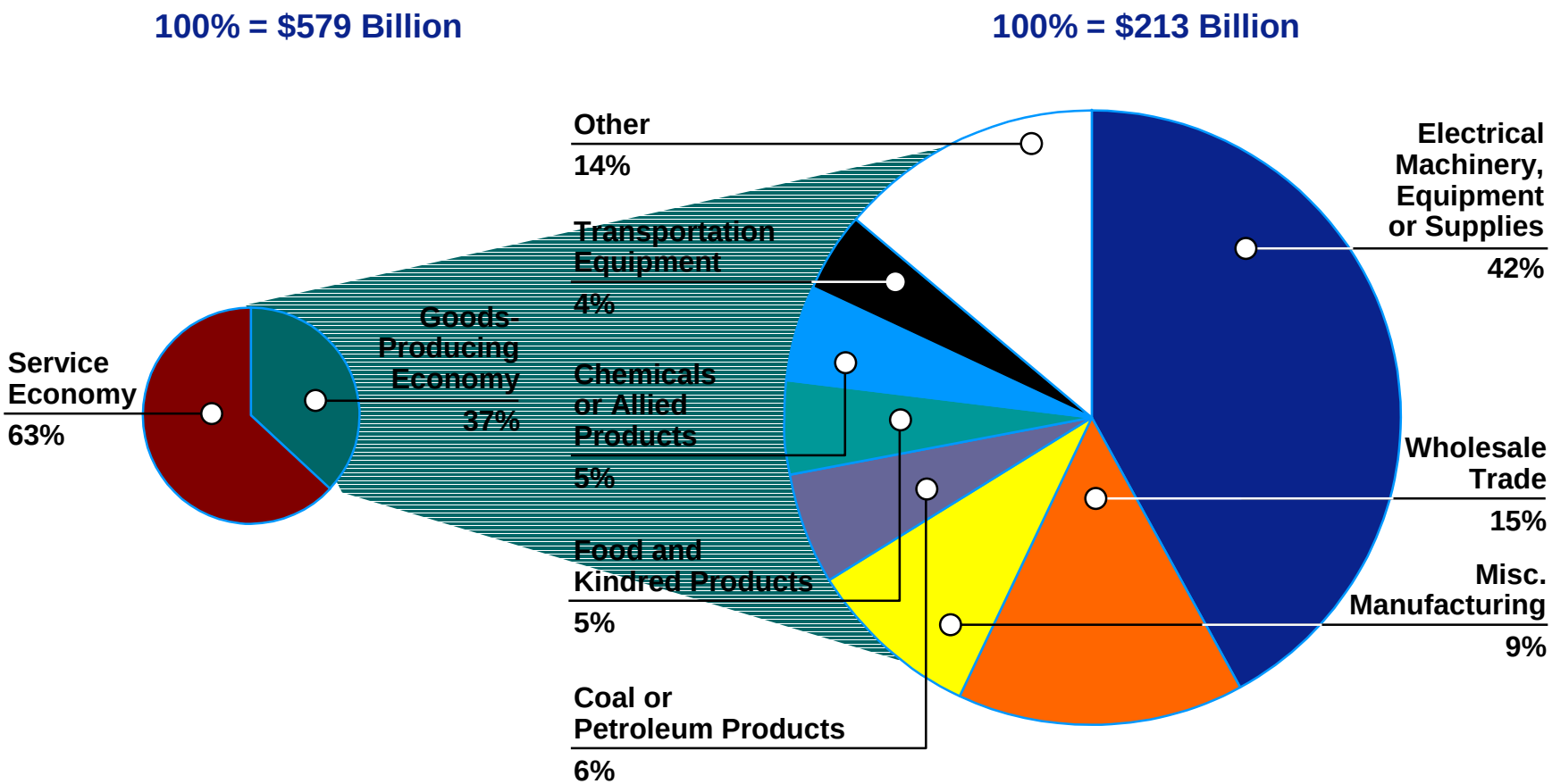
While consumption of goods represents the largest of these activities, the next several sections present information about the significance of goods production and the purchase of freight transportation services.

Goods Production and the Bay Area Economy

In 2000, goods producing sectors comprised 37% of the Bay Area economy, based on value of shipments (IMPLAN Input-Output model). The largest share of this output comes from the manufacture of electrical machinery, equipment, and supplies. Included within the goods producing sectors for this analysis is wholesale trade. Although not technically a goods producing sector, wholesale trade generates a substantial amount of commodity movement in the Bay Area, and accounts for 15% of the value of outbound commodity shipments. Other major outbound commodity shipments include petroleum products, food and kindred products, chemicals, and transportation equipment.

Santa Clara County accounts for the largest value of goods shipped of all Bay Area counties and goods producing sectors are responsible for over 50% of the county's output (primarily in the high tech sectors). Alameda County is next in terms of value of shipments from goods production but the industry sectors responsible for this output are more varied (electrical machinery, transportation equipment, and food and kindred products are leading sectors).

Shipping Industries Support 37 percent of the Bay Area's Economic Output



Source: 2000 IMPLAN Data.

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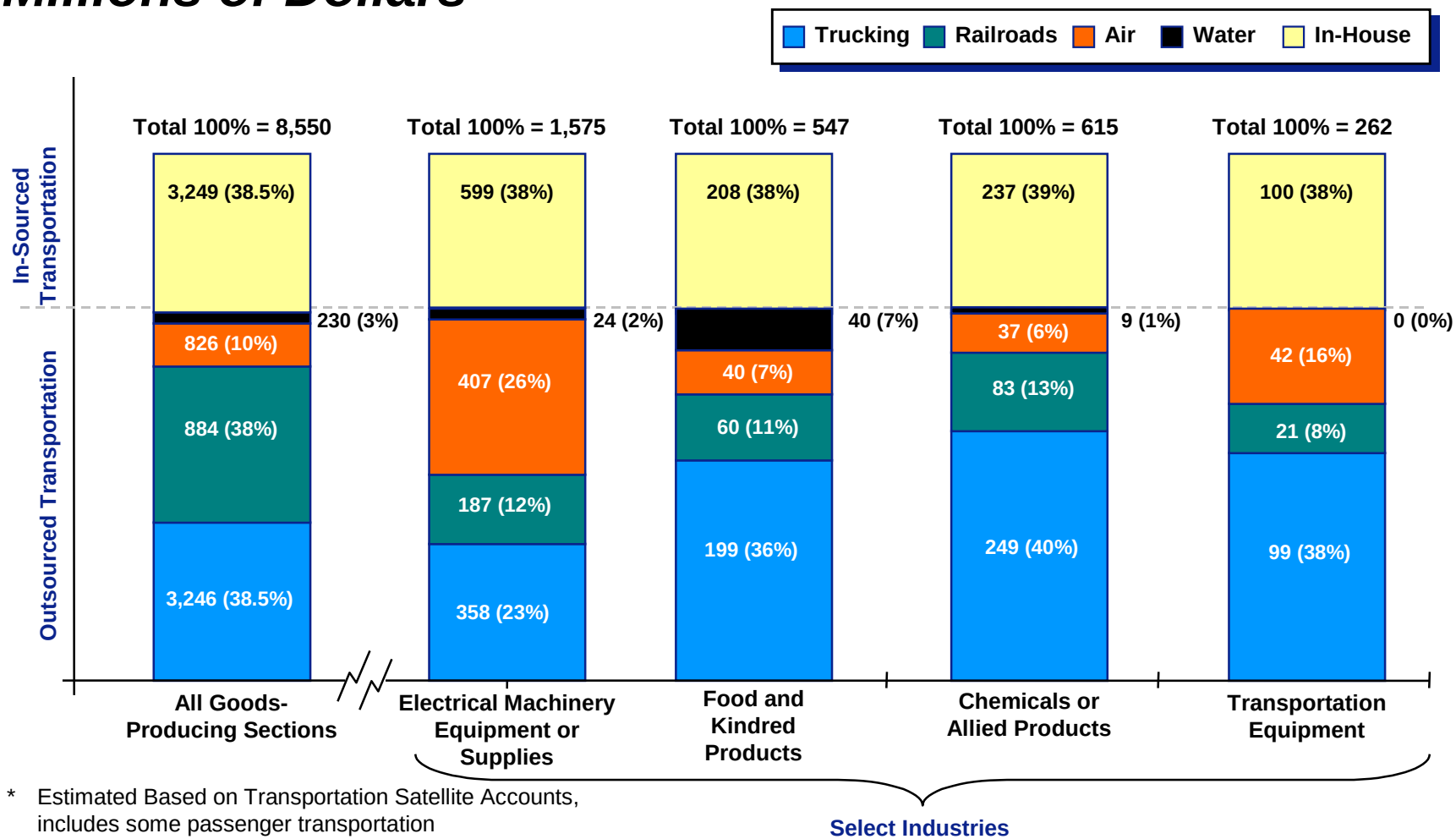
Expenditures on Goods Movement and the Importance of the Goods Movement Industries

Goods producing business spent approximately $8.6 billion on transportation in 2000, of which 38.5% were in-house expenditures. The mix of expenditures by mode varies significantly among some of the more important goods producing sectors, with the high tech sectors especially dependent on air freight and the chemical industry spending the highest percentage on trucking and rail.

Bay Area Expenditures on Transportation
Millions of Dollars



* Estimated Based on Transportation Satellite Accounts, includes some passenger transportation

Source: IMPLAN Data, CS estimates.

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Economic Output by Industry

Commodity Description	SCL	ALA	SF	CC	SM	SN	MRN	SOL	NAP	Bay Area Totals	Bay Area %	San Joaquin
Elec. Mach., equip. or sup.	73,176	8,999	382	732	3,734	2,798	362	163	118	90,464	42%	284
Wholesale Trade	12,170	7,717	3,747	2,222	3,573	1,034	782	529	219	31,994	15%	1,127
Misc. prod. of manuf.	3,898	5,132	2,619	2,720	1,609	1,462	777	1,018	417	19,652	9%	1,260
Petroleum or coal prod.	95	211	1,410	10,250	86	4	–	797	–	12,853	6%	20
Food and kindred prod.	855	3,242	743	724	552	2,073	60	962	1,862	11,075	5%	2,546
Chemicals or allied prod.	1,269	1,827	141	1,485	5,101	73	13	235	98	10,242	5%	142
Trans. equip.	2,700	4,654	34	70	206	98	14	64	4	7,845	4%	204
Printed matter	871	898	1,483	457	1,098	297	293	44	78	5,521	3%	107
Food Stores	850	1,146	409	609	389	312	202	220	83	4,222	2%	289
Fabricated metal prod.	817	1,699	146	257	355	151	32	353	111	3,919	2%	487
Farm Products	546	272	78	304	290	560	162	202	223	2,638	1%	1,407
Other	1,810	3,199	2,513	2,200	1,475	780	282	406	327	12,993	6%	1,582
All Goods-Producing Sectors	99,055	38,998	13,704	22,030	18,469	9,645	2,980	4,994	3,541	213,417	100%	9,455
Services	92,640	58,684	81,054	43,704	44,769	15,864	15,837	8,988	4,157	365,696	n/a	13,378
Total Output	191,695	136,680	108,463	87,763	81,707	35,155	21,796	18,976	11,239	792,530	n/a	32,288

Units in Millions of dollars

Source: 2000 IMPLAN Data.

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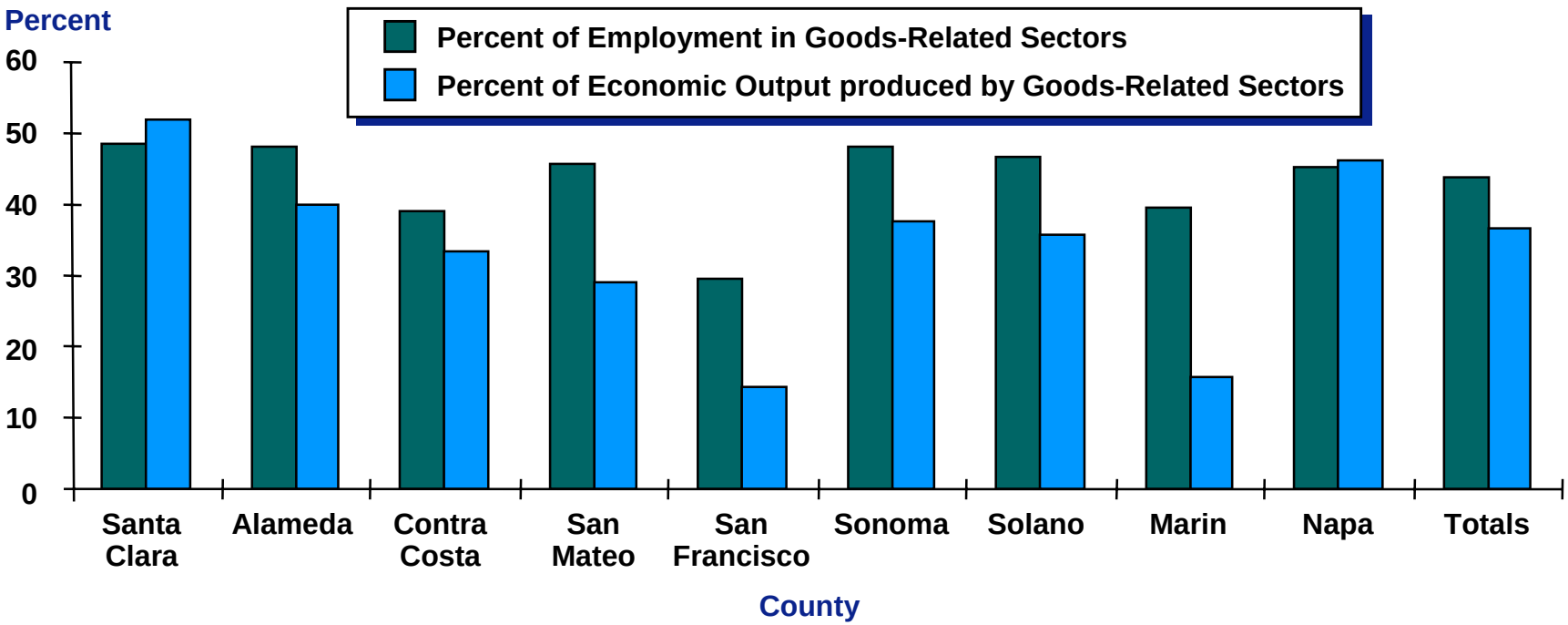
Transportation Dependent Industries

Adding wholesale and retail trade and the transportation industries themselves to the goods producing sectors identifies the industries that have the greatest reliance on freight transportation. In 2000, these industries employed almost 47% of all Bay Area workers. Santa Clara, Alameda, Sonoma, Solano, San Mateo, and Napa counties all had over 40% of their employment in the transportation dependent industries.

The transportation dependent industries experienced relatively low employment growth during the 1990s but are expected to grow more significantly over the next 20 years. It should be noted that national trends show that continuing improvements in labor productivity have resulted in substantial increases in goods shipped in spite of relatively flat employment growth in the goods producing sectors. Similar patterns should be expected in the Bay Area. It should be noted that the some of the highest rates of growth in employment in transportation dependent industries are expected in construction and wholesale trade. This should continue to stress the importance of providing a transportation network that is equipped to handle the transportation demands of these local distribution and service oriented sectors.

Importance of Transportation-Dependent Sectors to Local Economies



Source: 2000 ABAG data

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Employment by Industry and County

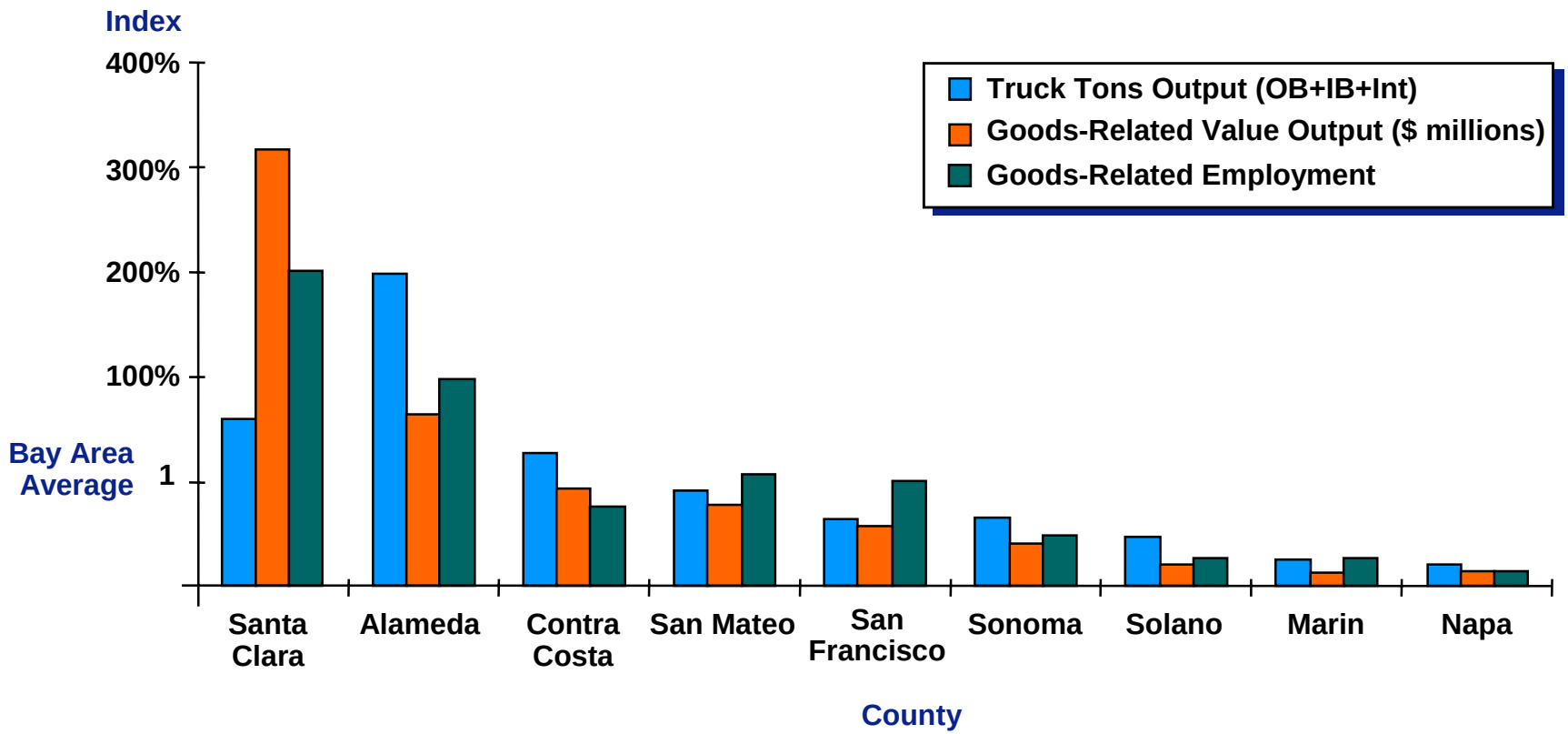
	2000										
	Alameda	Contra Costa	San Francisco	San Mateo	Santa Clara	Solano	Marin	Napa	Sonoma	Bay Area Totals	San Joaquin
Agriculture, Mining	3,460	3,590	700	3,500	6,780	3,030	740	5,530	7,840	35,170	16,900
Construction	34,770	23,560	22,420	18,860	51,270	12,840	6,770	4,360	14,560	189,410	11,600
High Technology	38,440	7,090	6,410	16,740	199,000	950	1,590	2,030	16,690	288,940	n/a
Other Manufacturing	69,720	26,200	24,130	21,300	70,950	9,630	3,560	8,100	16,690	250,280	24,700*
Transportation, Communication, Utilities	50,030	22,670	41,690	44,210	30,760	5,650	4,700	2,290	8,000	21,000	11,700
Wholesale Trade	55,130	12,380	23,450	21,110	61,930	3,340	4,380	2,590	7,330	191,640	6,400
Retail Trade	120,590	65,740	94,450	63,730	147,590	26,130	26,580	11,640	38,170	594,620	23,600
Total Goods-Related Employment	372,140	161,230	213,250	189,450	568,280	61,570	48,320	36,540	109,280	1,760,060	94,900
FIRE**, Services, Government	379,540	199,880	421,180	206,440	524,050	61,640	74,640	30,300	95,940	1,993,610	202,600
Total Jobs	751,680	361,110	634,430	395,890	1,092,330	123,210	122,960	66,840	205,220	3,753,670	297,500

*** Includes all manufacturing in San Joaquin County**
**** Finance, Insurance and Real Estate**

Source: 2002 ABAG data.

Relative Importance of Transportation Industry to County Economies

Trucking Example



Source: 2000 ABAG, 1996 ITMS data

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Employment Trends by Industry
Number of Employees

Industry	1990 (ABAG)	2000 (ABAG)	2020 (ABAG)	Annualized Growth Rates 1990-2000	Projected Annualized Growth Rates 2000-2020	
					ABAG	Woods & Poole*
Agriculture, Mining	36,980	35,170	35,770	-0.50%	0.08%	0.75%
Construction	148,360	189,410	239,590	2.47%	1.18%	0.93%
High Technology	280,040	288,940	355,660	0.31%	1.04%	0.13%
Other Manufacturing	236,880	250,280	305,790	0.55%	1.01%	0.13%
Trans., Comm., Utilities	189,390	210,000	263,100	1.04%	1.13%	1.67%
Wholesale Trade	192,000	191,640	240,460	-0.02%	1.14%	0.92%
Retail Trade	534,960	594,620	729,640	1.06%	1.03%	0.92%
FIRE**, Services, Gov't	1,587,560	1,993,610	2,539,950	2.30%	1.22%	1.47%
Total Jobs	3,206,170	3,753,670	4,709,960	1.59%	1.14%	1.14%

- *Woods & Poole Economics, Inc. is an independent firm that specializes in long-term county economic and demographic projections
- ** Finance, Insurance and Real Estate

Employment Trends by County
Number of Employees

County	1990	2000 (ABAG)	2020 (ABAG)	Annualized Growth Rates 1990-2000	Projected Annualized Growth Rates 2000-2020	
					ABAG	Woods & Poole*
Alameda	644,100	751,680	964,740	1.56%	1.26%	1.18%
Contra Costa	314,550	361,110	470,480	1.39%	1.33%	1.38%
San Francisco	579,180	634,430	745,600	0.92%	0.81%	0.79%
San Mateo	326,670	395,890	480,970	1.94%	0.98%	1.12%
Santa Clara	890,930	1,092,330	1,341,430	2.06%	1.03%	1.12%
Solano	123,590	123,210	174,110	-0.03%	1.74%	1.71%
Marin	107,410	122,960	155,160	1.36%	1.17%	1.20%
Napa	49,100	66,840	88,210	3.13%	1.40%	1.48%
Sonoma	170,550	205,220	289,260	1.87%	1.73%	1.57%
Bay Area	3,206,080	3,753,670	4,709,960	1.59%	1.14%	1.14%

*** Woods & Poole Economics, Inc. is an independent firm that specializes in long-term county economic and demographic projections**

San Joaquin County Jobs by Industry

				Annualized Growth Rates	
	1990	2000	2020	1990-2000	2000-2020
Agriculture, Mining	15,700	16,900	15,900	0.74%	-0.30%
Construction	9,500	11,600	16,200	2.02%	1.69%
Manufacturing	24,300	24,700	25,700	1.61%	0.20%
Transportation and Utilities	6,100	11,700	25,300	6.73%	3.63%
Wholesale and Retail Trade	24,700	30,000	89,600	1.96%	5.63%
FIRE**, Services, Government	88,000	107,700	159,600	2.04%	1.99%
Total Employment	168,300	202,600	332,300	1.87%	2.50%

Note: 1990 and 2000 data from California Employment Development Department; 2020 data from Caltrans
** Finance, Insurance and Real Estate

Source: California Employment Development Department; San Joaquin Council of Governments; Hausrath Economics Group